

**REPORT PREPARED FOR SENATOR TOM COBURN  
BY PRESIDENT DAVID SCHMIDLY  
REGARDING FEDERAL EARMARKED FUNDING FOR  
OKLAHOMA STATE UNIVERSITY**

**ANSWERS TO QUESTIONS 1-6  
OF LETTER DATED JULY 27, 2006**

- 1) Please provide a list of all appropriations received by your institution from the year 2000 to present, and the amount of assistance received.

**ANSWER:** List provided in attached document.

- 2) Please provide a summary of the specific objectives or goals set to be achieved .... for each appropriation ... depending upon the nature of the earmarks your institution has received.

**ANSWER:** Summary provided in attached document.

- 3) How does your institution set a measure for standards to achieve quality and outcomes for entities, programs, projects or services receiving assistance through earmarks or appropriations?

**ANSWER:** Information contained in cover letter.

- 4) Does your institution have a stated policy regarding Congressional earmarks or appropriations? Does your institution have a policy regarding partnering in research projects with other universities who may have a differing policy?

**ANSWER:** Oklahoma State University participates in numerous research collaborations with other universities in Oklahoma and around the nation. We have never had any type of policy conflict regarding earmarked appropriations during my tenure as President.

- 5) Has your institution hired a lobbyist to assist your institution in attaining familiarity with the opportunities that may exist to obtain federal funds for research – such as the earmarking process?

**ANSWER:** Yes, we have a lobbying firm engaged on our behalf. Our lobbyists in Washington help us identify opportunities for federal

research funding both through competitive programs offered by agencies of the federal government and Congressional earmarking. They also provide us with important assistance with respect to collaborative research opportunities with other research universities. They also provide us with information on federal and Congressional education policies and legislation, such as the reauthorization of the Higher Education Act and the Farm Bill, guidance on working with federal agencies and departments and liaison with our Oklahoma Congressional Delegation and other Members of Congress and committees which have a bearing on the activities of our institution.

- 6) In conclusion, do you find Congressionally earmarked funds to have contributed in a substantive way to your academic institution?

ANSWER: Yes. Details are provided in cover letter.

# Oklahoma State University Congressional Agenda Directed Appropriations Years 2003 through 2006

Name of Initiative	Federal Funding Received (In Thousands)				Description of Initiative
	FY 2003	FY 2004	FY 2005	FY 2006	
Aging Systems Sustainment and Enabling Technologies (ASSET)	2,800	0	1,500	1,000	This program matches the airplane parts needed by Tinker Air Force Base with Oklahoma Manufacturers-many located in small rural communities. Contracts have averaged a total of \$10 million per year.
Bioresearch Defense and Advanced Sensors Research	2,100	0	NR	NR	Direct research funding to support the OSU Center for Sensors and Sensor Technology with a goal to develop a "smart" badge (early warning system) for first responders.
Center for Aircraft and Systems/Support Infrastructure (CASI)	3,000	1,200	1,000	1,000	Applied research collaboration between OSU, OU, TU, Rose State, Langston, and the Oklahoma Air Logistics Center to enhance the maintenance repair and overhaul of aircraft and aerospace systems.
Center for Excellence in Intelligent Telecommunications Technologies (COEITT)	200	NR	NR	NR	Provides assistance to the State's information and telecommunications technology companies by supporting the R&D needs of Oklahoma's nucleus of large IT companies and empowering Oklahoma's small to medium enterprises for the knowledge based economy.
Demilitarization and destruction of Conventional Munitions (DEMIL)	2,100	1,000	0	980	Partnership with the Defense Ammunition Center in McAlester, Oklahoma to fund innovative solutions to the destruction of obsolete ammunition.
Integrated Consortium for Energy and the Environment (ICEE)	900	900	1,200	0	A multi-university consortium with the mission of decreasing the cost of environmental compliance in the domestic energy industry and increasing the quality and quantity of domestic energy sources while protecting natural resources.
Multi-Spectrum Laboratory and Analytical Services Center (ASCENT)	NR	NR	NR	1,000	Sensor testing facility to provide direct support to the OSU Sensor and Sensor Technology Center of Excellence and other universities across the country. Represents a partnership between OSU, Ponca City and the Federal Government.
New Product Development Commercialization Center (NPDCC)	0	0	514	650	A four-state consortium that partners small manufacturers with the expertise available through land-grant universities to develop and commercialize rural manufacturer's unique new product concepts.
Northern OK Multimodal Transportation Facilities & Transit	3,000	7,704	4,960	NR	Construction to begin in 2007. Intrastate public transportation system to encourage more Oklahomans to seek higher education.
Protective Apparel Technologies	NR	NR	NR	3,000	Currently being used in Iraq with much success. Manufactured in Pauls Valley, OK.
Rural NE OK Economic & Business Development (OSU-Okmulgee)	125	0	NR	NR	This program works with "existing" small and midsize businesses in rural Northeastern Oklahoma to assist in expansion, job growth, and economic security through enhanced skill set development.
Animal Waste Management Research	300	312	279	277	Animal waste generation, management, environmental impacts, and economics in semiarid climates.
Biomass-based Energy Research	898	1,068	956	947	A consortium of three universities (Oklahoma State University, (OSU), University of Oklahoma, (OU), and Mississippi State University, (MSU)) is working to refine and commercialize a unique gasification-fermentation process utilizing plant biomass to produce liquid fuel.

Expanded Wheat Pasture Research	273	288	257	255	Develop science and technologies, uniquely adapted wheat varieties, decision support models, and extension education programs to increase profitability of the use of dual purpose wheat and the livestock stocker enterprise.
Food Safety	374	580	519	515	Develop rapid and efficient methods for detecting and controlling food borne pathogens throughout the food chain from point of origin to consumption.
Integrated Production Systems	165	216	193	192	Develop and refine crop management techniques to produce organically grown vegetable crops and crops suitable for the emerging bio-fuel industry.
Preservation & Processing Research	207	208	187	185	Integrate cropping, harvesting, handling, storage and processing systems to facilitate new crop endeavors as well as development of new businesses.
Pilot Technology Transfer	161	144	143	143	Provide technology services and engineering assistance to small, rural manufacturers in cooperation with Mississippi State University to improve their profitability and enhance rural economic development.

\*NR = No Requested funding



## **Aging Systems Sustainment and Enabling Technologies (ASSET)**

Specific objective for this project are:

1. Increase/maintain the industrial supply base to support Aging Aircraft needs
2. Effectively provide solutions to problem parts acquisitions by DoD
3. Lower DoD acquisition costs from 15 to 85 percent
4. Reduce (parts) delivery cycle time by 50 percent
5. Expand/replicate the program nation wide

To meet these specific objectives the following accomplishments can be attributed to this project:

1. In Oklahoma, the ASSET manufacturing network is made up of approximately 245 small and mid-size manufacturers. Of the 245 firms, 125 Oklahoma manufacturers have obtained source approval status with DoD
2. Total follow-on contract (DoD/DLA) award dollars to Oklahoma mid-sized manufacturers participating in the ASSET program is in excess of \$20 million \*\*, for fiscal years 2001 through 2006
3. ASSET has achieved cost savings to DoD on parts production from 15 percent to 85 percent. The cycle times have been reduced from contract awards to parts deliveries by as much as 50 percent
4. As a national model, replication has occurred in Alaska, Ohio, Georgia, North Carolina and Idaho
5. Oklahoma firms participating in the ASSET program have documented 492 new jobs \*\* and \$9M \*\* in capital investments
6. Additional Funding from Federal, Industry and State Sources
  - a. Total Federal funding-\$12,900,000
  - b. Total State funding-\$660,830

## **Bioterrorism Defense and Advanced Sensors Research**

Specific objectives for this project are:

1. Expand target probe development
2. AFP materials development
3. Development of AFP platforms and assay methods on molecular beacon probes
4. Development of AFP platforms and assay methods for quantitative PCR
5. Evaluation and qualification of AFP quantitative PCR reagents
6. Development of AFP platform and methods for low-density microarray analysis
7. Prototype design, development and systems engineering of an AFP based, low density microarray reader
8. Evaluation and qualification of the AFP-based, low density microarray reader
9. Sample preparation

To meet these specific objectives the following accomplishments can be attributed to this project:

1. Peer-Reviewed Research Publications = 8
2. Patent Applications = 1
3. Additional Competitively- Awarded Research Funding
  - a. State Support (OCAST) = 3 grants
  - b. National Institutes of Health = 5 grants

## **Center for Aircraft and Systems/Support Infrastructure (CASI)**

### Specific objective for this project are:

1. Develop a unique applied research partnership between the OC-ALC and the Higher Education Institutions and Faculty in Oklahoma
2. Determine best-value proposals on projects identified by the OC-ALC and execute the projects to assist the ALC with operating problems and technology needs using expertise of the higher education faculty
3. Forge better mutual understanding and support between the higher education system and the State's largest single site employer leading to leveraging of the expertise at the universities to the benefit of the ALC while enhancing engineering and technology student involvement and recruiting at the ALC
4. Enhance University cooperation and collaboration in support of applied research needs at the OC-ALC and the Education and Training Partnership between Higher Education and the OC-ALC

### To meet these specific objectives the following accomplishments can be attributed to this project:

1. Ratio of Identified Net Savings Quantified to Program Cost ~7:1
2. Projects Completed (1999 – 2006) = 128 See Appendix to Report)
3. Project Area/Topics – 95
4. Number of Wing-level Operational Units At OC-ALC – 5
5. Number of Wing-level Organizational Units Supported by Projects - 5
6. Number of Oklahoma Universities Involved in Project Work – 8
7. Number of Projects Performed by Multi-University Teams of Researchers - 12
8. Faculty With Direct Exposure to OC-ALC Operations and Personnel – 65
9. Graduate Students With Direct Exposure to OC-ALC Operations and Personnel – 75
10. Internal OC-ALC Publication (Final Project Reports/Briefings) - 128
11. Publications and Theses = 6
12. Additional Funding from Federal, Industry and State Sources
  - a. Additional OC-ALC and State Funds = \$1.1M



## **Center of Excellence in Intelligent Telecommunications Technologies (COEITT)**

Specific objectives for this project are:

1. Develop a Center of Excellence in Information and Telecommunications Technologies (COEITT) research collaboration program through seed research projects at the three partner universities (OSU, OU, and TU)
2. Develop activities that will enhance research collaboration among the three universities
3. Enhance awareness of COEITT faculty research excellence to promote research funding, industry-university partnerships and economic development
4. Expand private sector involvement in research and programs of these universities

To meet these specific objectives the following accomplishments can be attributed to this project:

1. Peer reviewed publications = 3
2. Completed thesis/dissertation = 3
3. Graduate students in progress = 2
4. Proceedings Publications = 2
5. Proposal submitted for external funding: 4 (NSF, DARPA, EPSCoR)
6. Invited International, National and Regional presentations = 3
7. Other International, National and Regional Meetings presentations = 2
8. Extending knowledge to the public = 11
9. Additional Funding from Federal, Industry and State Sources: Not applicable, because COEITT has been closed. Individual faculty members continue to pursue funding of security and IT related projects.

## **Demilitarization and Destruction of Conventional Munitions (DEMIL)**

Specific objectives for this project are:

1. Determine the pathway and mechanism of photocatalytic degradation of TNT by sunlight (What chemicals are produced in the process?)
2. Determine if the catalytic process can be used to destroy other chemicals or biological agents such as nerve agents, pesticides, or environmental pollutants such as ammonium perchlorate (rocket fuel)
3. Determine functional operating conditions for the process such as temperature, oxygen levels, pH, light intensity, etc.
4. Devise new techniques to measure and detect the chemical, biological, and energetic agents we will encounter
5. Design and build prototype solar photocatalytic reactors compete with motorized hardware, on-board sensors for position, temperature, pH, flow rates, and the amount of the chemical we wish to destroy
6. Field-test (beta test) the reactors at Defense Ammunition Center facilities as well as commercial ammunition plant
7. Transfer and commercialize this technology to provide these solar reactors to the government and the chemical destruction and demilitarization communities

To meet these specific objectives the following accomplishments can be attributed to this project:

1. Peer reviewed publications = 3
2. Book chapters = 3
3. Completed thesis/dissertation = 5
4. Graduate students currently in the program = 4; 2 have finished and left
5. Invited International, National and Regional presentations = 9
6. International and National presentations at meetings/symposia = 32
7. Additional Funding from Federal, Industry and State Sources:
  - Oklahoma Center for the Advancement of Science and Technology: \$135,000
  - US Army Defense Ammunition Center, McAlester, OK: \$118,000

## **Multi-Spectrum Laboratory and Analytical Services Center (ASCENT)**

Specific objectives for this project are:

1. Take possession of research facilities already identified at two locations – one in Ponca City and one in Stillwater.
2. Conduct engineering survey, design and renovation of the facilities as per requirements for CBRNE work at Ponca City and C4ISR work in Stillwater.
3. Initiate sensor research in “stand-off” Biometrics using federal contracts from the US Space and Naval Warfare Systems (SPAWAR), centered at Ponca City – see below.
4. Initiate sensor research in secure communications (“C4ISR”), centered at Stillwater.
5. Conduct chemical, biological, radiological, nuclear, explosive, command, control, communications, computing, intelligence, surveillance, reconnaissance, and other sensor-related research, development, and testing.
6. Provide training and educational opportunities that will fuse academic, technical, and tactical knowledge and experience.
7. Facilitate rapid movement of concepts to marketable products via technology transfer.
8. Provide a geographically central location to conduct qualification and comparative testing.
9. Provide a secure facility to locate proprietary, sensitive, and classified research as needed.
10. Enhance collaborations among universities, government authorities, and the private sector.
11. Provide training for new sensor technologies.
12. Act as a repository for storage and exchange of data.

To meet these specific objectives the following accomplishments can be attributed to this project:

1. This is a start-up project building off OSU sensor research success and appropriated funds have not yet been received.

The initial FY06 funding will be devoted to sensor technologies for “stand-off” biometric identification, as per SOCOM requirements and request. Initial operations of the OSU-UML to date have been to identify technologies and individuals necessary for carrying out the functions of the UML in this area. Once the contract has been fully awarded work will proceed in full.

2. City of Ponca City, OK and ConocoPhillips have committed a total of \$4 Million to this project with matching funds from the state.

# **Northern Oklahoma Multimodal Transportation Facilities and Transit**

## Specific objectives for this project are:

1. Increase regional mobility with the development of a transit center for THE BUS Community Transit system in Stillwater as well as the “BOB” Stillwater / Tulsa Shuttle, Greyhound, and other regional transit services from Ponca City, Guthrie, Enid, and Pawnee.
2. Reduce traffic congestion in the Stillwater area by providing new automobile parking away from high traffic demand locations.
3. Provide access to other transportation modes including bicycle and pedestrian services.
4. House a passenger waiting area, Parking and Transit Services Departmental offices, and an OSU Police substation.

## To meet these specific objectives the following accomplishments can be attributed to this project:

1. 12 Bay Transit and Commuter Bus Parking Area
2. Parking for from 1,200 to 1,500 cars
3. 15,000 Square Foot Passenger Waiting Area, Office Space and Police Substation
4. Parking for 50 Bicycles
5. Funding from Federal, Industry and State Sources
  - a. Federal Support = \$14,521,643
  - b. State Support = \$5,478,357

Total Funding by sources other than Special Grants for this project total = \$20,000,000

# **Institute for Protective Apparel Research and Technology (IPART)**

## Specific objectives for this project are:

1. IPART goals for the Protective Apparel Technology Systems program in FY 06-08 include:
  - Development of an integrated body armor system
  - Advancement in the development of smart clothing
  - Advancement in the development of a portable active personal cooling system
2. IPART research, development and testing will be conducted in four thrust areas:
  - Ballistic impact protection
  - Integration of sensor technology into clothing applications
  - Micro-climate cooling systems technology
  - Sizing systems
3. National benefits would include:
  - Improved ballistic protection for the military with application to the civilian sector
  - An active cooling system for the first responder and military communities
  - Generation of prototype smart clothing system for use by the first responder and military communities
4. Local benefits would include:
  - Economic development and business expansion in Oklahoma through new opportunities for sewn products manufacturers' production of OSU-developed protective garment systems. Markets would include the US military and the first responder communities
  - Establishment of OSU as a national leader in the research and development of protective clothing systems
  - Involvement of Oklahoma military units and the Oklahoma State University ROTC program in anti-ballistic and sensor technology development and testing

## To meet these specific objectives the following accomplishments can be attributed to this project:

1. Relevant Scientific Presentations = 31
2. Relevant Refereed Publications = 25
3. Patents = 2
4. Leverage Funds =
  - Body Armor Project, FSTechnology, D. Branson/C. Farr/S. Peksoz
  - Development of Structural Fire Fighter Ensemble, FireDex, Incorporated, D. Branson/S. Peksoz/V. Quevedo
  - Ultra-Lightweight Modular Cooling System, NanoPore, Inc/ Homeland Security Advanced Research Projects Agency (HSARPA) SBIR, S. Peksoz, D. Branson/H. Cao
  - Protective Clothing for Terrorism Incidents, MIPT, D. Branson/C. Farr/H. Cao
  - Exploratory Development of Smart Textiles for Chemical Detection, NSF, H. Cao/D. Branson/J. Harmon

## **Rural Northeast Oklahoma Economic and Business Development Center OSU-Okmulgee**

### Specific objectives for this project are:

1. Provide clients (primarily small and medium-size rural firms) of the Commerce Development Center (CDC) with hands-on basic and advanced training in the use and application of manufacturing equipment and processes as well as business management skills
2. Integration and sharing of existing higher education economic development programs such as Computer Assisted Technology Transfer (CATT), Quality Deployment Programs (QDP) and Electronic Commerce. These programs assist the small- and medium- size rural manufacturing company to become a certified supplier for the Department of Defense (DoD) and Defense Logistics Agency (DLA)
3. Through applied research sponsored/coordinated by OSU-Okmulgee, assist rural Oklahoma firms continually “add value” to their products and services
4. Increase the time to market for rural Oklahoma firms
5. Relative ease of developing, integrating and delivering on-site industry-specific education and training

### To meet these specific objectives the following accomplishments can be attributed to this project:

1. Assisted 43 CDC clients over the grant reporting period (September 30, 2003 – September 29, 2005)
2. A total of 50 small to mid size companies have been assisted in becoming a certified supplier to DoD and/or DLA
3. Implemented a new electronic procurement program called “Email” was developed by DoD to enhance the Military’s purchasing programs. NEOMC members listed 35 parts on the electronic system that were available for purchase
4. In calendar year 2003 and 2004 the CATT and QDP programs created and/or retained 350 jobs and generated \$29.9 Million new revenue for NEOMC members
5. Through OSU-Okmulgee’s Economic Development and Training Center department 655 industry students have been served over this grant period. The education and training ranges from Statistical Process Control to ISO Quality programs to Information Technology
6. A research commercialization process has been developed and implemented in a collaborative effort between OSU-Okmulgee and Stillwater (main campus) with Okmulgee being the lead institution. The primary purpose of this program is to increase commercialization of research in the University System (basic and applied research) with a focus on rural Oklahoma and specifically with the Native American Tribes

## **Animal Waste Project**

Specific objectives for this project are:

1. Develop sustainable, environmentally safe, and ecologically sound practices for beneficial animal waste management
2. Determine best management practices for maximum nutrient utilization in cropping systems following land application of animal waste
3. Determine ammonia emissions from animal waste into the environment
4. Determine phytase activity and phosphorus cycling in soils amended with animal manure
5. Alter nutrient content of manure via diet modification of swine
6. Develop technology transfer systems readily available to research and extension personnel, producers, and the general public

To meet these specific objectives the following accomplishments can be attributed to this project:

1. Peer reviewed publications = 18
2. Book chapters = 1
3. Completed thesis/dissertation = 14
4. Graduate students in progress = 8
5. Undergraduates researchers trained = 45
6. Proceedings publications = 15
7. Experiment station publications = 17
8. Published abstracts = 39
9. Invited international, national and regional presentations = 5
10. Non-invited international, national and regional meetings presentations = 40
11. Extending knowledge to the public = 11
12. Additional funding from federal, industry and state sources
  - a. Competitive federal support = \$99,600
  - b. Industry support = \$227,600
  - c. State support = \$5,729,166

Total funding by sources other than special grants for this project total = \$6,056,366

## **Biomass-based Energy Research Project**

Specific objectives for this project are:

1. Feedstock development: To identify and develop biomass sources, including the establishment of optimal procedures for stand establishment and sustained biomass production for selected species with potential as dedicated feedstock crops.
2. Biomass gasification and syngas conditioning: To optimize the gasification/conditioning process and evaluate syngas quantity and quality from a vast number of biomass sources.
3. Syngas fermentation: To optimize the bioconversion process for the production of ethanol and other products through syngas fermentation.
4. Microbial catalyst development: To increase the concentration of ethanol and other valued products from existing, and yet to be identified microbial catalysts.
5. Economics and modeling: To determine the economic feasibility and environmental impact of an agricultural lignocellulosic bioconversion industry in Oklahoma.

To meet these specific objectives the following accomplishments can be attributed to this project (2000 to present):

1. Peer reviewed publications = 36
2. Book chapters = 8
3. Completed thesis/dissertation = 24
4. Graduate students in progress = 10
5. Undergraduates researchers trained = 35
6. Published abstracts/ proceedings publications = 84
7. Experiment station publications = 7
8. Invited international, national and regional presentations = 2
9. Non-invited international, national and regional meetings presentations = 40
10. Extending knowledge to the public = 20
11. Additional funding from federal, industry and state sources
  - a. Competitive federal support = \$2,361,177
  - b. Industry support = \$33,000
  - c. State support = \$204,938

Total funding by sources other than special grants for this project total = \$2,599,115



## **Expanded Wheat Pasture Project**

Specific objectives for this project are:

1. Develop supplementation programs and programs for delivery of new technologies that will decrease production risks of growing cattle on wheat pasture and increase profitability of the enterprise
2. Characterize the physiological bases for differences in finishing performance of feeder cattle from different growing programs
3. Determine the effects of wheat genetic selection, varieties, and cultural and management practices on productivity of the wheat/stocker cattle enterprise
4. Develop crop simulation models by using remote satellite technologies, vehicle-mounted sensors, and quantitative light-interception measurements to elucidate the physiological parameters that determine wheat forage mass and composition
5. Determine the economic consequences of alternative strategies for managing cropland suitable for dual-purpose winter wheat production
6. Determine persistence, yield, and nutritive value of selected cool-season perennial forage grasses as complementary forages to wheat pasture

To meet these specific objectives the following accomplishments can be attributed to this project (2000 to present):

1. Peer reviewed publications = 51
2. Completed thesis/dissertation = 15
3. Graduate students in progress = 7
4. Undergraduate researchers trained = 25
5. Published abstracts/Proceedings publications = 10
6. Experiment station publications = 7
7. Extending knowledge to the public = 25
8. Additional funding from federal, industry, and state sources
  - a. Competitive federal support = \$5,711,799
  - b. Industry support = \$117,188
  - c. State support = \$1,439,270

Total funding by sources other than special grants for this project total = \$7,268,257

# Food Safety Project

## Specific objectives for this project are:

1. Determine the effect of *Lactobacillus acidophilus* (a probiotic or direct fed microbial currently used in the livestock industry) on the immune response of swine and cattle
2. Develop molecular imprinted polymers to be used on test strips for rapid detection of *Escherichia coli* 0157:H7 in food and other materials
3. Develop molecular imprinted polymers to be used on test strips for rapid detection of *Escherichia coli* 0157:H7 in food and other materials
4. Optimize a fluorescence-based polymerase chain reaction (PCR) assay for *Listeria monocytogenes* in foods
5. Evaluate transport trailers as a source of pathogenic contamination of beef cattle during transport to slaughter facilities
6. Determine if abnormal prion proteins can be removed or inactivated in animal by-products
7. Type strains of *Listeria monocytogenes* based on gene content using DNA microarrays and analyses of virulence mechanisms based on expression of virulence genes
8. Develop a “lock and key” diagnostic tool that allows us to trace the origin (vegetative cell) of a bioterrorism agent (toxin) using *Staphylococcus aureus* and staphylococcal enterotoxin as a model
9. Develop and test immunoPCR based technique for rapid detection of peanut/nut and other foods based allergens and compare its sensitivity with commercially available testing kits

## To meet these specific objectives the following accomplishments can be attributed to this project (2000 to present):

1. Peer reviewed publications = 7
2. Completed thesis/dissertation = 6
3. Graduate students in progress = 2
4. Undergraduate researchers trained = 8
5. Published abstracts/proceedings publications = 1
6. Experiment station publications = 1
7. Non-invited international, national, and regional meetings presentations = 1
8. Extending knowledge to the public = 12
9. Additional funding from federal, industry, and state sources
  - a. Competitive federal support = \$250,000
  - b. Industry support = \$560,000
  - c. State support = \$540,000
  - d. Royalties and endowments = \$200,000

Total funding by sources other than special grants for this project total = \$1,550,000

## **Integrated Production Systems Project**

Specific objectives for this project are:

1. Evaluate and/or develop certifiable organic methods of insect pest management for watermelon and leafy greens crops.
2. Evaluate cultural practices, mechanical and organic weed control agents for their effects on the management of annual weeds in cucurbits.
3. Develop certifiable organic methods of enhancing soil fertility and providing plant nutrition for vegetable crops.
4. Develop cost of production budgets for four vegetable crops (sweet corn, tomatoes, southern peas, and watermelon) grown with recommended "organic" technology.
5. Assess organic vegetable production needs through information exchange with Oklahoma organic vegetable producers.

To meet these specific objectives the following accomplishments can be attributed to this project:

1. Peer reviewed publications = 23
2. Completed thesis/dissertation = 10
3. Graduate students in progress = 2
4. Undergraduates researchers trained = 6
5. Published abstracts/proceedings publications = 17
6. Invited international, national and regional presentations = 6
7. Extending knowledge to the public =
8. Additional funding from federal, industry and state sources
  - a. Competitive federal support = \$535,256
  - b. Industry support = \$15,979
  - c. State support = \$25,000

Total funding by sources other than special grants for this project total = \$576,235

## **Preservation and Processing Research Project**

Specific objectives for this project are:

1. Development of systems and processes to support growth of the horticulture and related agriculture industries

To meet these specific objectives the following accomplishments can be attributed to this project:

1. Additional funding from federal, industry and state sources

- a. Competitive federal support = \$350,000
- b. Industry support = \$125,000
- c. State support = \$250,000

Total funding by sources other than special grants for this project total = \$725,000

## **Pilot Technology Transfer Project**

Specific objectives for this project are:

1. Continue the delivery of high-quality engineering and manufacturing management assistance/technology transfer services to the small manufacturers of Oklahoma
2. Demonstrate a value of services provided of at least six times the cost of operations

To meet these specific objectives the following accomplishments can be attributed to this project:

1. Increased Sales Revenue: 25 companies impacted = \$30,988,000 Impact
2. Retention of Sales: 17 companies impacted = \$14,840,000 Impact
3. Cost of Savings: 38 companies impacted = \$4,902,316 Impact
4. Increased Investment: 27 companies impacted = \$6,760,700 Increased Investments
5. Cost Avoidance: 23 companies impacted = \$2,752,000 Impact
6. Number of New Jobs Created: 13 companies impacted; 149 jobs retained = \$16,763,442 Impact
7. Number of Jobs Retained: 15 companies impacted; 222 jobs retained = \$16,763,442 Impact
8. Total: \$53,482,816 Impact; 371 jobs retained; \$28,014,581 Impact; Increased Investment = \$6,760,000
9. Total Economic Impact = \$88,258,097